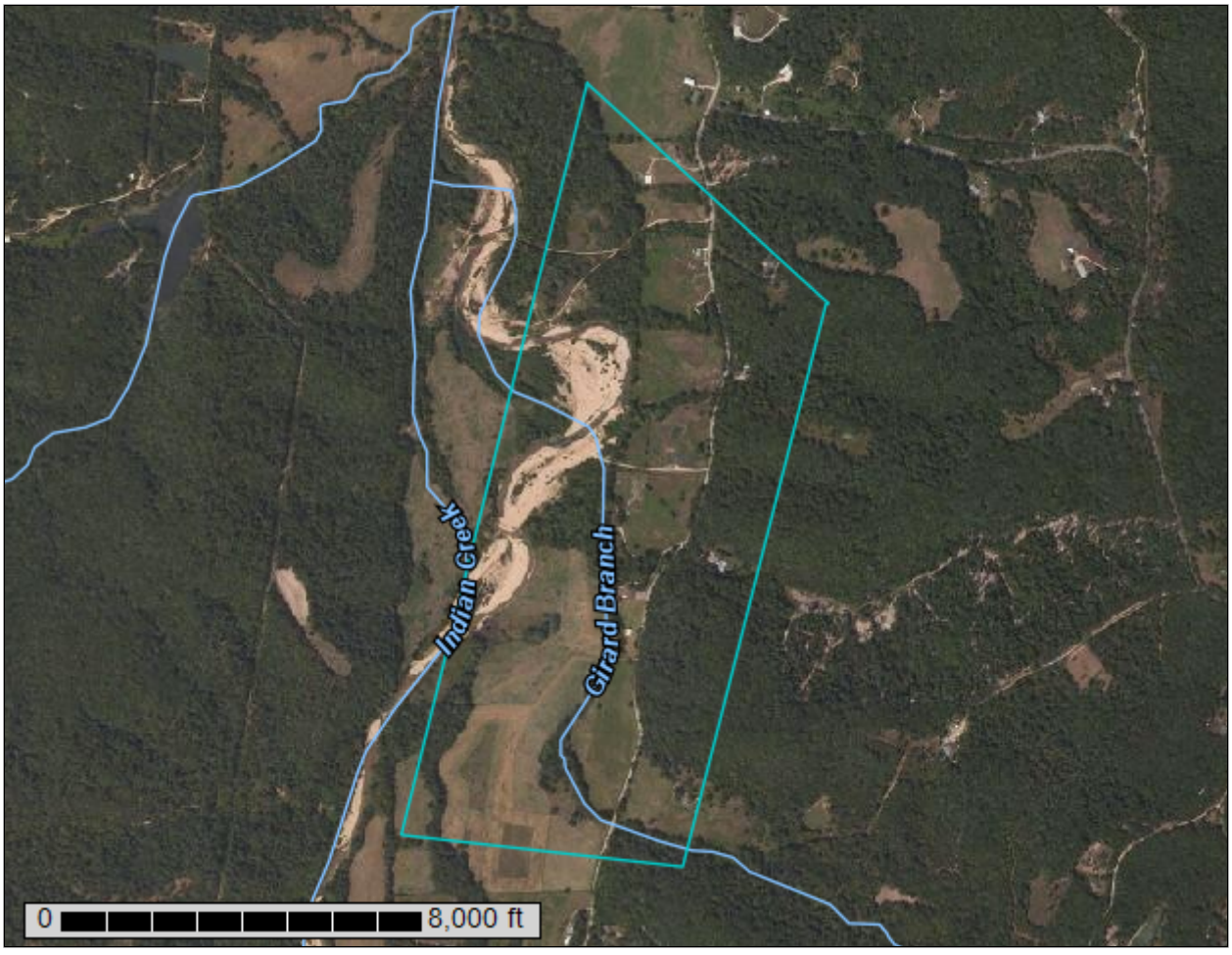
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Franklin County, Missouri



November 6, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

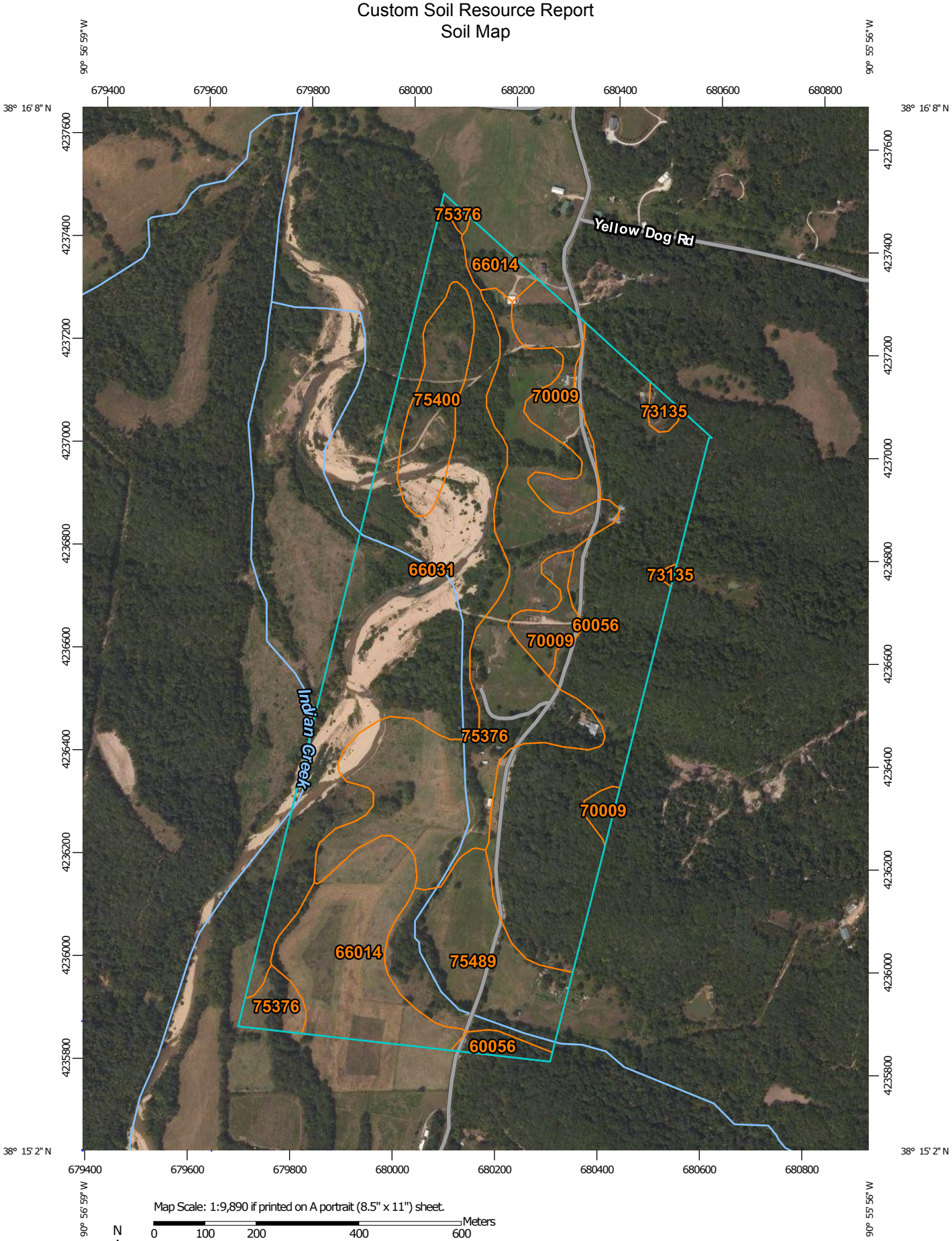
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:9,890 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County, Missouri
Survey Area Data: Version 15, Sep 17, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 17, 2010—Mar 9, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Franklin County, Missouri (MO071)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
60056	Bardley gravelly silt loam, 20 to 50 percent slopes	53.6	24.1%
66014	Haymond silt loam, 0 to 3 percent slopes, frequently flooded	22.8	10.2%
66031	Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded	54.5	24.6%
70009	Goss gravelly silt loam, 8 to 15 percent slopes	13.9	6.2%
73135	Union silt loam, 3 to 8 percent slopes	1.1	0.5%
75376	Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded	47.4	21.3%
75400	Gladden silt loam, 0 to 2 percent slopes, frequently flooded	9.3	4.2%
75489	Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded	19.6	8.8%
Totals for Area of Interest		**222.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different

management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Franklin County, Missouri

60056—Bardley gravelly silt loam, 20 to 50 percent slopes

Map Unit Setting

National map unit symbol: m6jv
Elevation: 500 to 1,100 feet
Mean annual precipitation: 31 to 43 inches
Mean annual air temperature: 54 to 57 degrees F
Frost-free period: 160 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Bardley and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bardley

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Slope alluvium over residuum weathered from dolomite over dolomite

Typical profile

A - 0 to 2 inches: gravelly silt loam
E - 2 to 10 inches: very gravelly silt loam
2Bt - 10 to 28 inches: clay
2R - 28 to 80 inches: bedrock

Properties and qualities

Slope: 20 to 50 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Quercus alba-quercus rubra/cercis canadensis-staphylea trifolia/hepatica nobilis-delphinium tricorne (F116AY016MO), Quercus stellata-quercus marilandica/rhus aromatica/schizachyrium scoparium (F116AY048MO)
Other vegetative classification: Trees/Timber (Woody Vegetation)

66014—Haymond silt loam, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2qp8f
Elevation: 340 to 800 feet
Mean annual precipitation: 37 to 47 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 184 to 228 days
Farmland classification: Not prime farmland

Map Unit Composition

Haymond and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haymond

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 7 inches: silt loam
Bw - 7 to 22 inches: silt loam
C - 22 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B
Ecological site: Ulmus americana-celtis occidentalis/vitis-staphylea trifolia/carex-laportea canadensis (F115BY031MO)
Other vegetative classification: Trees/Timber (Woody Vegetation)

66031—Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: m6jw
Elevation: 340 to 900 feet
Mean annual precipitation: 31 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 160 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Haymond and similar soils: 40 percent
Relfe and similar soils: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haymond

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 7 inches: silt loam
Bw - 7 to 22 inches: silt loam
C - 22 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very high (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B
Ecological site: Fraxinus pennsylvanica-ulmus americana/vitis-ilex decidua/carex-impatiens (F116AY041MO)
Other vegetative classification: Trees/Timber (Woody Vegetation)

Description of Relfe

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 6 inches: very gravelly sandy loam
C - 6 to 60 inches: extremely gravelly loamy coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A
Ecological site: Platanus occidentalis-populus deltoides/salix/elymus-campanula americana (F116AY042MO)
Other vegetative classification: Trees/Timber (Woody Vegetation)

70009—Goss gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2qpbk
Elevation: 800 to 1,500 feet
Mean annual precipitation: 41 to 45 inches
Mean annual air temperature: 55 to 57 degrees F
Frost-free period: 194 to 221 days
Farmland classification: Not prime farmland

Map Unit Composition

Goss and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Goss

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Slope alluvium over residuum weathered from limestone

Typical profile

A - 0 to 6 inches: gravelly silt loam
E - 6 to 19 inches: extremely gravelly silt loam
Bt1 - 19 to 60 inches: very gravelly silty clay loam
2Bt2 - 60 to 80 inches: gravelly clay

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Quercus alba-quercus velutina/rhus aromatica/solidago ulmifolia-schizachyrium scoparium (F116BY003MO)
Other vegetative classification: Trees/Timber (Woody Vegetation)

Minor Components

Lowassie

Percent of map unit: 5 percent
Landform: Sinkholes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Ponded sinkhole wetland (R116AY029MO)
Other vegetative classification: Trees/Timber (Woody Vegetation)

73135—Union silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2qpj1
Elevation: 340 to 1,020 feet
Mean annual precipitation: 39 to 49 inches
Mean annual air temperature: 54 to 59 degrees F
Frost-free period: 172 to 232 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Union and similar soils: 90 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Union

Setting

Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over pedisediment over residuum weathered from dolomite

Typical profile

Ap - 0 to 9 inches: silt loam
Bt - 9 to 30 inches: silty clay loam
2Btx - 30 to 53 inches: extremely gravelly silt loam
3Bt - 53 to 80 inches: very gravelly clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 14 to 35 inches to fragipan
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: Quercus stellata-quercus marilandica/rhus aromatica/ schizachyrium scoparium-desmodium (F116AY004MO)

Other vegetative classification: Trees/Timber (Woody Vegetation)

Minor Components

Glensted

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)

Mariosa

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Trees/Timber (Woody Vegetation)

75376—Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2qpzx
Elevation: 500 to 800 feet
Mean annual precipitation: 39 to 49 inches
Mean annual air temperature: 54 to 59 degrees F
Frost-free period: 172 to 232 days
Farmland classification: Not prime farmland

Map Unit Composition

Cedargap and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cedargap

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 9 inches: gravelly silt loam
A - 9 to 18 inches: very gravelly loam
Bw1 - 18 to 49 inches: very gravelly sandy clay loam
2Bw2 - 49 to 80 inches: gravelly clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 42 to 60 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B
Ecological site: Platanus occidentalis-populus deltoides/salix/elymus-campanula americana (F116AY042MO)
Other vegetative classification: Mixed/Transitional (Mixed Native Vegetation)

Minor Components

Farewell

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Trees/Timber (Woody Vegetation)

75400—Gladden silt loam, 0 to 2 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2qq0n
Elevation: 350 to 900 feet
Mean annual precipitation: 39 to 49 inches
Mean annual air temperature: 54 to 59 degrees F
Frost-free period: 172 to 232 days
Farmland classification: Not prime farmland

Map Unit Composition

Gladden and similar soils: 85 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gladden

Setting

Landform: Flood plains
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Alluvium

Typical profile

Ap - 0 to 6 inches: silt loam
Bw - 6 to 38 inches: silt loam
2C - 38 to 80 inches: stratified extremely gravelly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B
Ecological site: Quercus rubra-acer saccharum/asimina triloba/asarum canadense-carex (F116AY039MO)
Other vegetative classification: Trees/Timber (Woody Vegetation)

Minor Components

Racoon

Percent of map unit: 5 percent
Landform: Flood-plain steps
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)

Dockery

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Trees/Timber (Woody Vegetation)

75489—Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: m6j7
Elevation: 500 to 1,000 feet
Mean annual precipitation: 24 to 50 inches

Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 172 to 232 days
Farmland classification: Not prime farmland

Map Unit Composition

Gladden and similar soils: 65 percent
Midco and similar soils: 20 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gladden

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over gravelly alluvium

Typical profile

A - 0 to 5 inches: silt loam
Bw - 5 to 53 inches: gravelly loam
2C - 53 to 80 inches: extremely gravelly coarse sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B
Ecological site: Quercus rubra-acer saccharum/asimina triloba/asarum canadense-carex (F116AY039MO)
Other vegetative classification: Trees/Timber (Woody Vegetation)

Description of Midco

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium

Typical profile

A - 0 to 5 inches: very gravelly sandy loam
C1 - 5 to 40 inches: very gravelly coarse sandy loam
C2 - 40 to 80 inches: stratified extremely gravelly loamy coarse sand to very gravelly coarse sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A
Ecological site: Platanus occidentalis-populus deltoides/salix/elymus-campanula americana (F116AY042MO)
Other vegetative classification: Trees/Timber (Woody Vegetation)

Minor Components

Twomile

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Trees/Timber (Woody Vegetation)

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

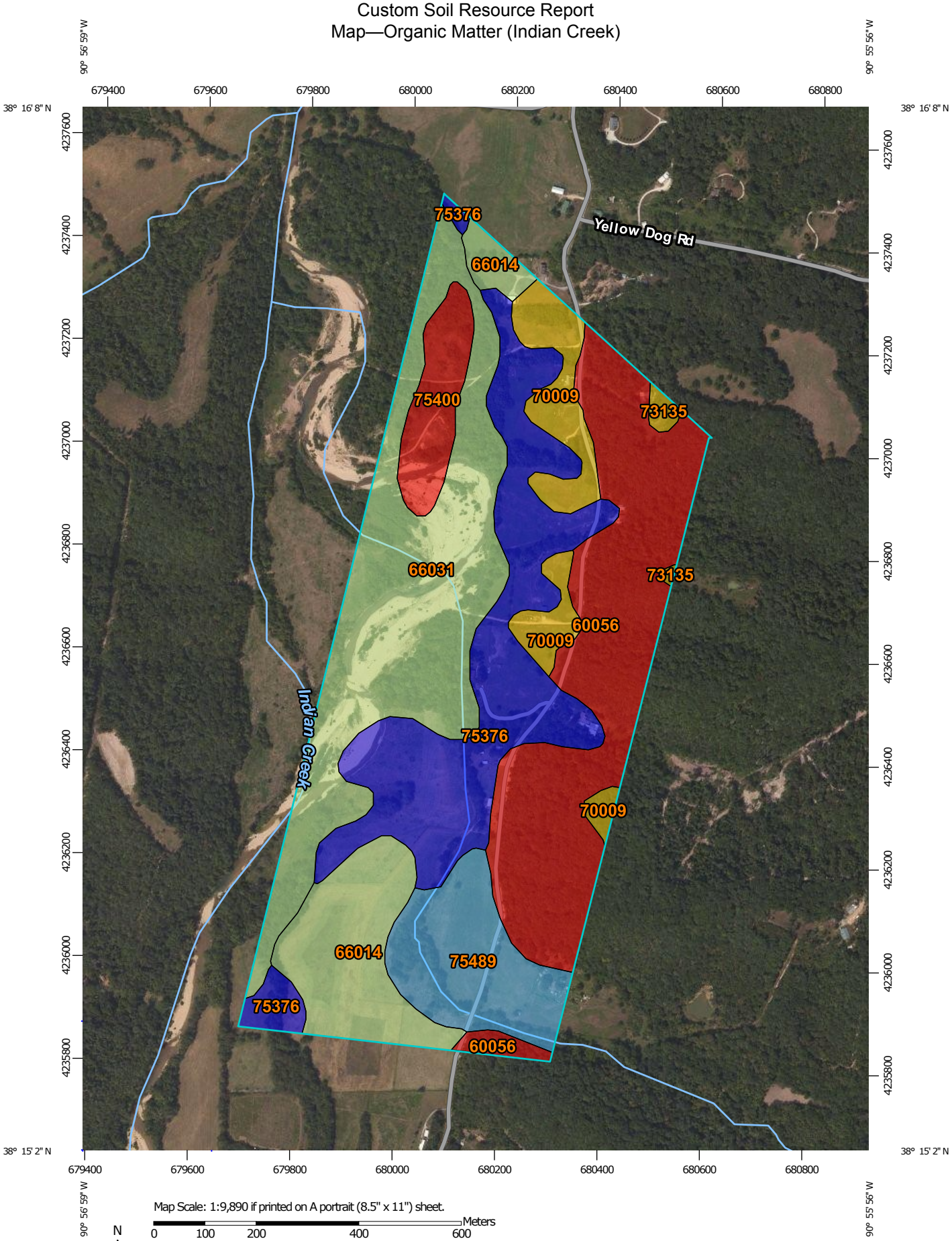
Organic Matter (Indian Creek)

Organic matter is the plant and animal residue in the soil at various stages of decomposition. The estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms. An irregular distribution of organic carbon with depth may indicate different episodes of soil deposition or soil formation. Soils that are very high in organic matter have poor engineering properties and subside upon drying.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Organic Matter (Indian Creek)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- <= 0.89
- > 0.89 and <= 1.06
- > 1.06 and <= 1.53
- > 1.53 and <= 1.85
- > 1.85 and <= 2.57
- Not rated or not available

Soil Rating Lines
- <= 0.89
- > 0.89 and <= 1.06
- > 1.06 and <= 1.53
- > 1.53 and <= 1.85
- > 1.85 and <= 2.57
- Not rated or not available

Soil Rating Points
- <= 0.89
- > 0.89 and <= 1.06
- > 1.06 and <= 1.53
- > 1.53 and <= 1.85
- > 1.85 and <= 2.57
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County, Missouri
Survey Area Data: Version 15, Sep 17, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 17, 2010—Mar 9, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Organic Matter (Indian Creek)

Organic Matter— Summary by Map Unit — Franklin County, Missouri (MO071)				
Map unit symbol	**Map unit name**	**Rating (percent)**	**Acres in AOI**	**Percent of AOI**
60056	Bardley gravelly silt loam, 20 to 50 percent slopes	0.89	53.6	24.1%
66014	Haymond silt loam, 0 to 3 percent slopes, frequently flooded	1.53	22.8	10.2%
66031	Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded	1.53	54.5	24.6%
70009	Goss gravelly silt loam, 8 to 15 percent slopes	0.98	13.9	6.2%
73135	Union silt loam, 3 to 8 percent slopes	1.06	1.1	0.5%
75376	Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded	2.57	47.4	21.3%
75400	Gladden silt loam, 0 to 2 percent slopes, frequently flooded	0.87	9.3	4.2%
75489	Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded	1.85	19.6	8.8%
Totals for Area of Interest			**222.1**	**100.0%**

Rating Options—Organic Matter (Indian Creek)

Units of Measure: percent

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 1

Bottom Depth: 36

Units of Measure: Centimeters

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties.

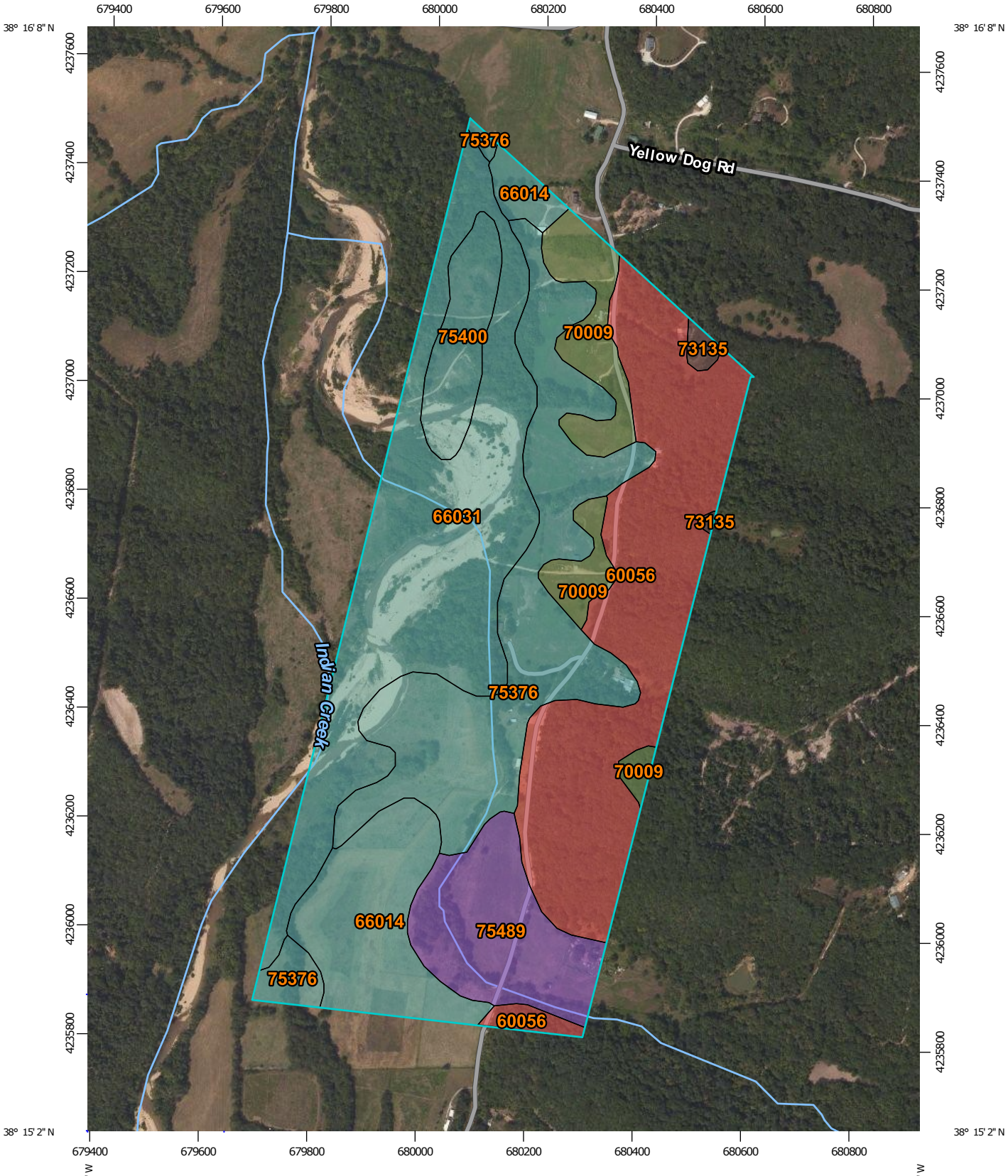
Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Parent Material Name (Indian Creek)

Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material.

For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.



Map Scale: 1:9,890 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- alluvium
- loamy alluvium over gravelly alluvium
- loess over pedisediment over residuum weathered from dolomite
- slope alluvium over residuum weathered from dolomite over dolomite
- slope alluvium over residuum weathered from limestone
- Not rated or not available

Soil Rating Lines

- alluvium
- loamy alluvium over gravelly alluvium
- loess over pedisediment over residuum weathered from dolomite
- slope alluvium over residuum weathered from dolomite over dolomite
- slope alluvium over residuum weathered from limestone
- Not rated or not available

Soil Rating Points

- alluvium
- loamy alluvium over gravelly alluvium
- loess over pedisediment over residuum weathered from dolomite
- slope alluvium over residuum weathered from dolomite over dolomite
- slope alluvium over residuum weathered from limestone
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County, Missouri
Survey Area Data: Version 15, Sep 17, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 17, 2010—Mar 9, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Parent Material Name (Indian Creek)

Parent Material Name— Summary by Map Unit — Franklin County, Missouri (MO071)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
60056	Bardley gravelly silt loam, 20 to 50 percent slopes	slope alluvium over residuum weathered from dolomite over dolomite	53.6	24.1%
66014	Haymond silt loam, 0 to 3 percent slopes, frequently flooded	alluvium	22.8	10.2%
66031	Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded	alluvium	54.5	24.6%
70009	Goss gravelly silt loam, 8 to 15 percent slopes	slope alluvium over residuum weathered from limestone	13.9	6.2%
73135	Union silt loam, 3 to 8 percent slopes	loess over pedisediment over residuum weathered from dolomite	1.1	0.5%
75376	Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded	alluvium	47.4	21.3%
75400	Gladden silt loam, 0 to 2 percent slopes, frequently flooded	alluvium	9.3	4.2%
75489	Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded	loamy alluvium over gravelly alluvium	19.6	8.8%
Totals for Area of Interest			**222.1**	**100.0%**

Rating Options—Parent Material Name (Indian Creek)

Aggregation Method: Dominant Condition

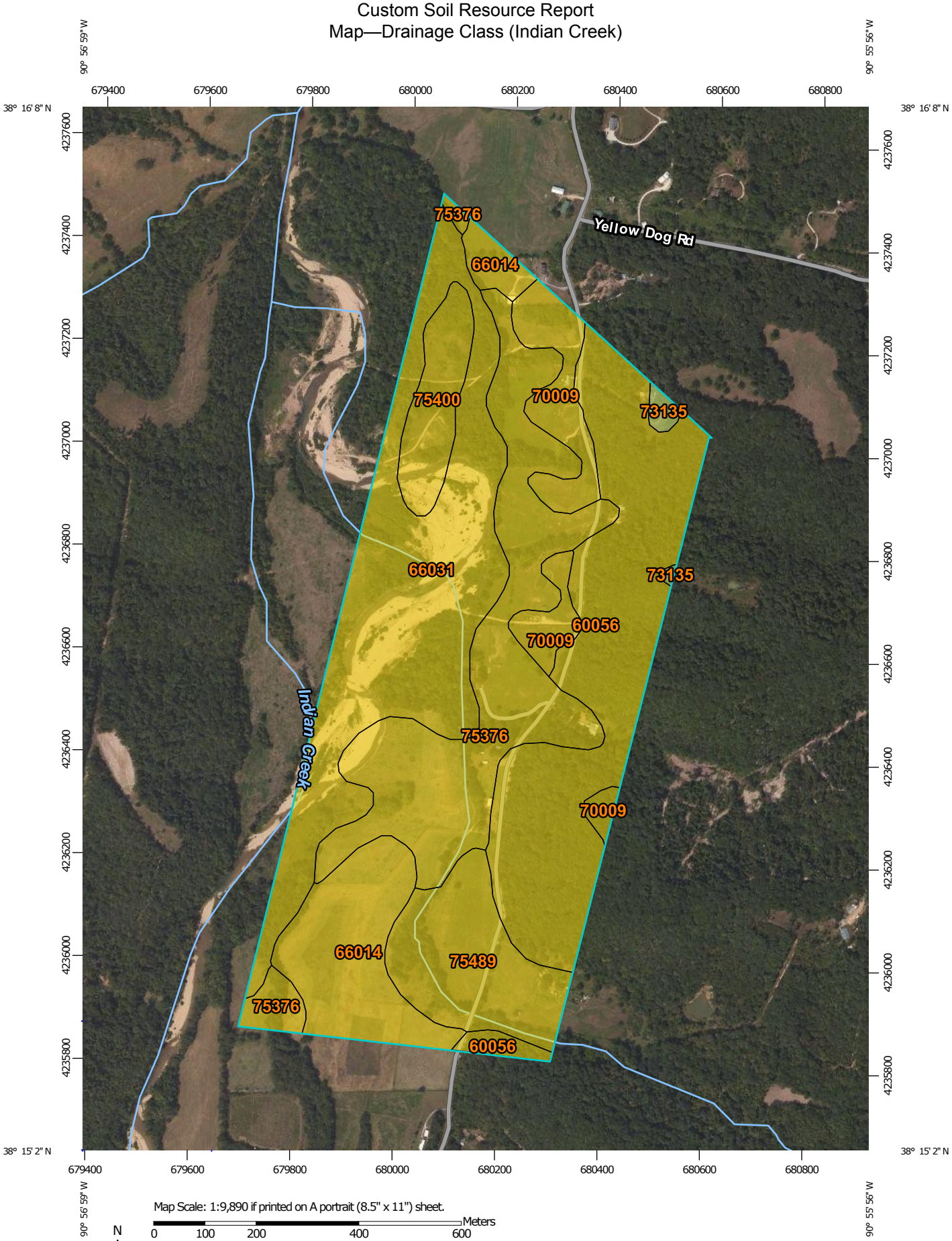
Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Drainage Class (Indian Creek)

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Map—Drainage Class (Indian Creek)



Map Scale: 1:9,890 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Lines

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Points

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 15, Sep 17, 2014

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Date(s) aerial images were photographed: Sep 17, 2010—Mar 9, 2012

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Table—Drainage Class (Indian Creek)

Drainage Class— Summary by Map Unit — Franklin County, Missouri (MO071)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
60056	Bardley gravelly silt loam, 20 to 50 percent slopes	Well drained	53.6	24.1%
66014	Haymond silt loam, 0 to 3 percent slopes, frequently flooded	Well drained	22.8	10.2%
66031	Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded	Well drained	54.5	24.6%
70009	Goss gravelly silt loam, 8 to 15 percent slopes	Well drained	13.9	6.2%
73135	Union silt loam, 3 to 8 percent slopes	Moderately well drained	1.1	0.5%
75376	Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded	Well drained	47.4	21.3%
75400	Gladden silt loam, 0 to 2 percent slopes, frequently flooded	Well drained	9.3	4.2%
75489	Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded	Well drained	19.6	8.8%
Totals for Area of Interest			**222.1**	**100.0%**

Rating Options—Drainage Class (Indian Creek)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Parent Material Name (Indian Creek)

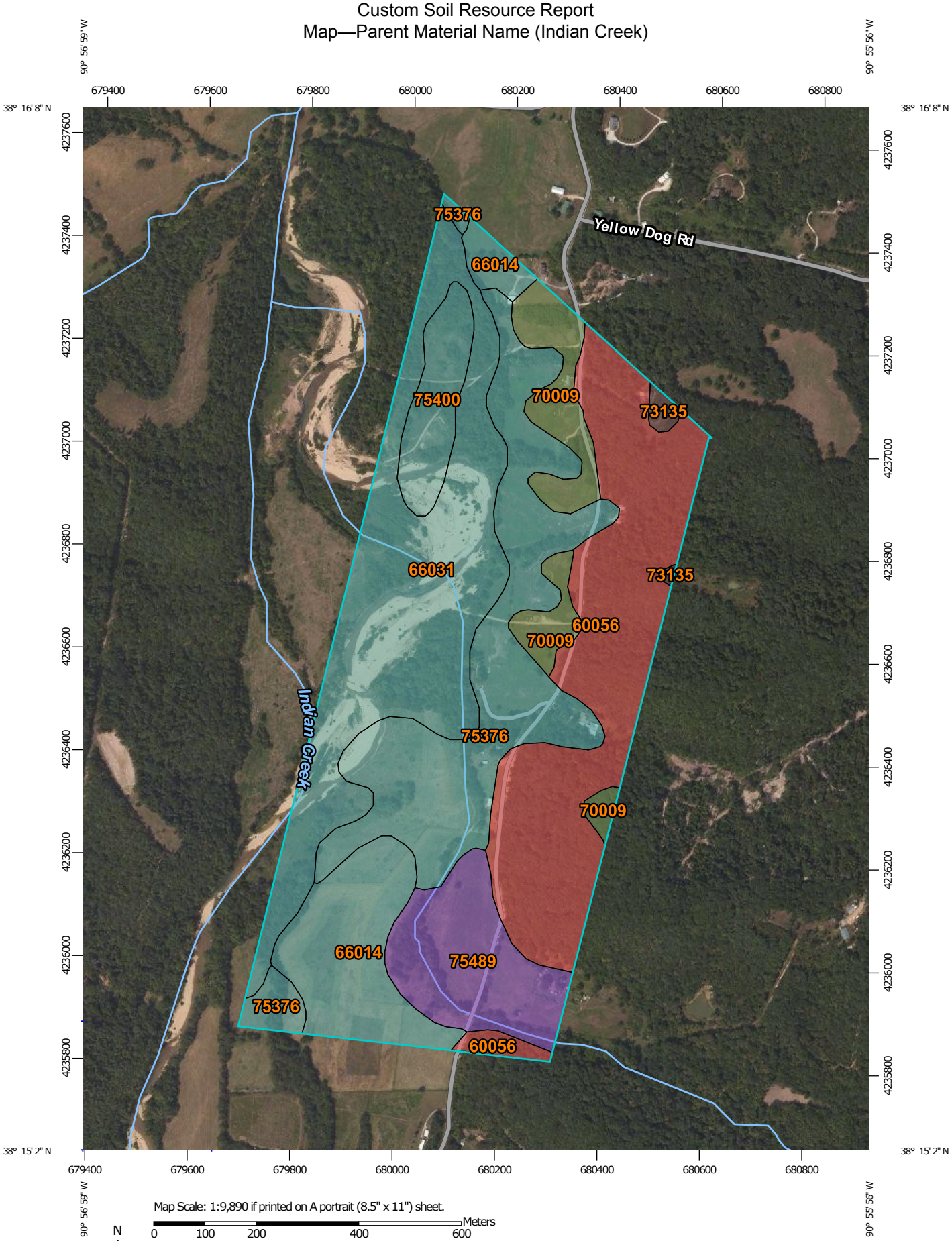
Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to

separate soil series. Soil properties and landscape information may imply the kind of parent material.

For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.

Map—Parent Material Name (Indian Creek)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- alluvium
- loamy alluvium over gravelly alluvium
- loess over pedisediment over residuum weathered from dolomite
- slope alluvium over residuum weathered from dolomite over dolomite
- slope alluvium over residuum weathered from limestone
- Not rated or not available

Soil Rating Lines

- alluvium
- loamy alluvium over gravelly alluvium
- loess over pedisediment over residuum weathered from dolomite
- slope alluvium over residuum weathered from dolomite over dolomite
- slope alluvium over residuum weathered from limestone
- Not rated or not available

Soil Rating Points

- alluvium
- loamy alluvium over gravelly alluvium
- loess over pedisediment over residuum weathered from dolomite
- slope alluvium over residuum weathered from dolomite over dolomite
- slope alluvium over residuum weathered from limestone
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Franklin County, Missouri
Survey Area Data: Version 15, Sep 17, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 17, 2010—Mar 9, 2012

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Table—Parent Material Name (Indian Creek)

Parent Material Name— Summary by Map Unit — Franklin County, Missouri (MO071)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
60056	Bardley gravelly silt loam, 20 to 50 percent slopes	slope alluvium over residuum weathered from dolomite over dolomite	53.6	24.1%
66014	Haymond silt loam, 0 to 3 percent slopes, frequently flooded	alluvium	22.8	10.2%
66031	Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded	alluvium	54.5	24.6%
70009	Goss gravelly silt loam, 8 to 15 percent slopes	slope alluvium over residuum weathered from limestone	13.9	6.2%
73135	Union silt loam, 3 to 8 percent slopes	loess over pedisediment over residuum weathered from dolomite	1.1	0.5%
75376	Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded	alluvium	47.4	21.3%
75400	Gladden silt loam, 0 to 2 percent slopes, frequently flooded	alluvium	9.3	4.2%
75489	Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded	loamy alluvium over gravelly alluvium	19.6	8.8%
Totals for Area of Interest			**222.1**	**100.0%**

Rating Options—Parent Material Name (Indian Creek)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

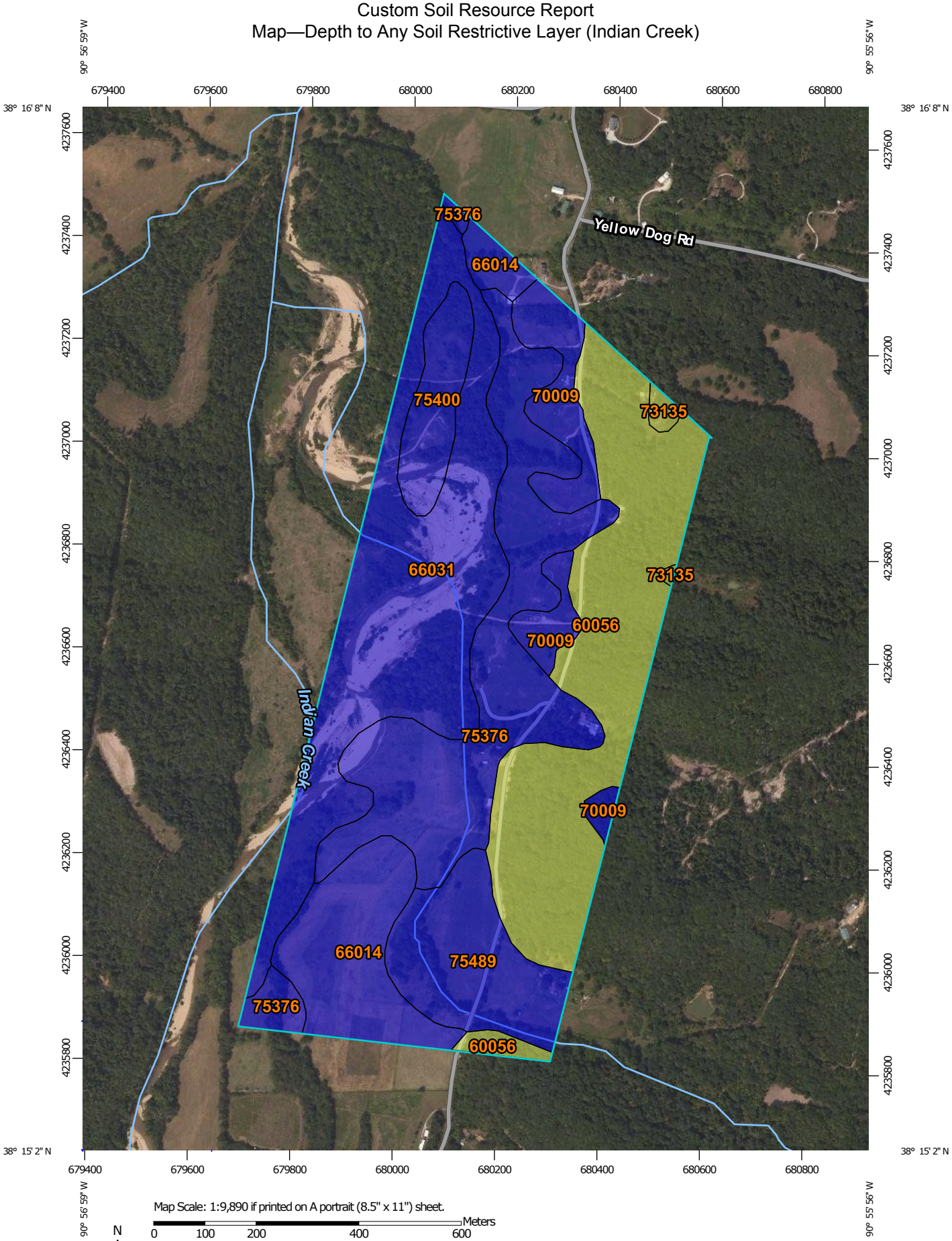
Depth to Any Soil Restrictive Layer (Indian Creek)

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

This theme presents the depth to any type of restrictive layer that is described for each map unit. If more than one type of restrictive layer is described for an individual soil type, the depth to the shallowest one is presented. If no restrictive layer is described in a map unit, it is represented by the "> 200" depth class.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Depth to Any Soil Restrictive Layer (Indian Creek)



Map Scale: 1:9,890 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County, Missouri
Survey Area Data: Version 15, Sep 17, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 17, 2010—Mar 9, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Depth to Any Soil Restrictive Layer (Indian Creek)

Depth to Any Soil Restrictive Layer— Summary by Map Unit — Franklin County, Missouri (MO071)				
Map unit symbol	**Map unit name**	**Rating (centimeters)**	**Acres in AOI**	**Percent of AOI**
60056	Bardley gravelly silt loam, 20 to 50 percent slopes	71	53.6	24.1%
66014	Haymond silt loam, 0 to 3 percent slopes, frequently flooded	>200	22.8	10.2%
66031	Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded	>200	54.5	24.6%
70009	Goss gravelly silt loam, 8 to 15 percent slopes	>200	13.9	6.2%
73135	Union silt loam, 3 to 8 percent slopes	76	1.1	0.5%
75376	Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded	>200	47.4	21.3%
75400	Gladden silt loam, 0 to 2 percent slopes, frequently flooded	>200	9.3	4.2%
75489	Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded	>200	19.6	8.8%
Totals for Area of Interest			**222.1**	**100.0%**

Rating Options—Depth to Any Soil Restrictive Layer (Indian Creek)

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Building Site Development

This folder contains a collection of tabular reports that present soil interpretations related to building site development. The reports (tables) include all selected map units and components for each map unit, limiting features and interpretive ratings. Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Dwellings and Small Commercial Buildings (Indian Creek)

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced

concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Dwellings and Small Commercial Buildings (Indian Creek)

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Dwellings and Small Commercial Buildings–Franklin County, Missouri							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
60056—Bardley gravelly silt loam, 20 to 50 percent slopes							
Bardley	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
66014—Haymond silt loam, 0 to 3 percent slopes, frequently flooded							
Haymond	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
66031—Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded							
Haymond	40	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Relfe	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
70009—Goss gravelly silt loam, 8 to 15 percent slopes							
Goss	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.07	Shrink-swell	0.20	Shrink-swell	0.07
73135—Union silt loam, 3 to 8 percent slopes							
Union	90	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to thin cemented pan	1.00
		Depth to thick cemented pan	0.54	Depth to thin cemented pan	1.00	Depth to saturated zone	0.95
		Depth to thin cemented pan	0.50			Depth to thick cemented pan	0.54
		Shrink-swell	0.06			Slope	0.50
						Shrink-swell	0.06

Dwellings and Small Commercial Buildings–Franklin County, Missouri							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
75376—Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded							
Cedargap	98	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.61		
75400—Gladden silt loam, 0 to 2 percent slopes, frequently flooded							
Gladden	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
75489—Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded							
Gladden	65	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Midco	20	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00

Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Taxonomic Classification of the Soils (Indian Creek)

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2003). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. This table shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol.* An example is Alfisols.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalfs (*Ud*, meaning humid, plus *alfs*, from Alfisols).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalfs*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, active, mesic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

References:
Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.
Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. (The soils in a given survey area may have been classified according to earlier editions of this publication.)

Report—Taxonomic Classification of the Soils (Indian Creek)

[An asterisk by the soil name indicates a taxadjunct to the series]

Taxonomic Classification of the Soils–Franklin County, Missouri	
Soil name	**Family or higher taxonomic classification**
Bardley	Very-fine, mixed, active, mesic Typic Hapludalfs
Cedargap	Loamy-skeletal, mixed, superactive, mesic Cumulic Hapludolls

Taxonomic Classification of the Soils–Franklin County, Missouri	
Soil name	**Family or higher taxonomic classification**
Gladden	Coarse-loamy, siliceous, superactive, mesic Dystric Fluventic Eutrudepts
Goss	Clayey-skeletal, mixed, active, mesic Typic Paleudalfs
Haymond	Coarse-silty, mixed, superactive, mesic Dystric Fluventic Eutrudepts
Midco	Loamy-skeletal, siliceous, superactive, nonacid, mesic Typic Udifluvents
Relfe	Sandy-skeletal, siliceous, mesic Mollic Udifluvents
Union	Fine, mixed, active, mesic Oxyaquic Fragiudalfs

Land Capability Classification (Indian Creek)

The land capability classification of map units in the survey area is shown in this table. This classification shows, in a general way, the suitability of soils for most kinds of field crops (United States Department of Agriculture, Soil Conservation Service, 1961). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

- Class 1 soils have slight limitations that restrict their use.
- Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.
- Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.
- Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.
- Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
- Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
- Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.
- Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion.

Report—Land Capability Classification (Indian Creek)

Land Capability Classification–Franklin County, Missouri				
Map unit symbol and name	**Pct. of map unit**	**Component name**	**Land Capability Subclass**	
			Nonirrigated	**Irrigated**
60056—Bardley gravelly silt loam, 20 to 50 percent slopes				
	90	Bardley	7e	—
66014—Haymond silt loam, 0 to 3 percent slopes, frequently flooded				
	90	Haymond	3w	—
66031—Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded				
	40	Haymond	3w	—
	35	Relfe	3w	—
70009—Goss gravelly silt loam, 8 to 15 percent slopes				
	85	Goss	4e	—
73135—Union silt loam, 3 to 8 percent slopes				
	90	Union	3e	—
75376—Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded				
	98	Cedargap	3w	—
75400—Gladden silt loam, 0 to 2 percent slopes, frequently flooded				
	85	Gladden	3w	—
75489—Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded				
	65	Gladden	3w	—
	20	Midco	4w	—

Prime and other Important Farmlands (Indian Creek)

This table lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Report—Prime and other Important Farmlands (Indian Creek)

Prime and other Important Farmlands–Franklin County, Missouri		
Map Symbol	**Map Unit Name**	**Farmland Classification**
60056	Bardley gravelly silt loam, 20 to 50 percent slopes	Not prime farmland
66014	Haymond silt loam, 0 to 3 percent slopes, frequently flooded	Not prime farmland
66031	Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded	Not prime farmland
70009	Goss gravelly silt loam, 8 to 15 percent slopes	Not prime farmland
73135	Union silt loam, 3 to 8 percent slopes	Farmland of statewide importance
75376	Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded	Not prime farmland
75400	Gladden silt loam, 0 to 2 percent slopes, frequently flooded	Not prime farmland
75489	Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded	Not prime farmland

NCCPI Overall (Indian Creek)

National Commodity Crop Productivity Index is a method of arraying the soils of the United States for non-irrigated commodity crop production based on their inherent soil properties. The rating a soil is assigned is the highest one of three basic crop group indices, which are based on the climate where the crop is typically grown. Cooler climates are represented by winter wheat, moderate climates are represented by corn and soybeans, and warmer climates are represented by cotton.

The interpretation is applicable to both heavily populated and sparsely populated areas. Ratings are for soils in their present condition. The present land use is not considered in the ratings.

Ratings are based on properties and qualities to the depth normally observed during soil mapping (approximately 6 feet). Soil, site, and climate properties that influence the growth of crops are major considerations. Soil productivity is influenced by many soil properties. An ideal soil will store adequate amounts of water to nurture the crop between rains. This soil will have a near-neutral pH, will store nutrients, and lack toxic materials. The soil will have no barriers, either physical or chemical, to root growth.

Water and gas transmission through the soil will be sufficient to maintain both water and oxygen at sufficient levels in the root zone. The soil will not be saturated with water during the growing season to the point that root growth is inhibited. The soil will not be subject to excessive flooding or ponding during the growing season. Slope is an important consideration because it affects erosion by water, runoff, and the operation of equipment. The climate must provide adequate water and heat to allow the desired crop to mature. A soil that differs from the ideal in any of these features will have lower inherent productivity for a particular crop. The further a soil differs from ideality in any one or all of the factors that determine inherent productivity, the lower its inherent productivity will be.

The ratings are both verbal and numerical. Rating class terms indicate the estimated productivity which is determined by all of the soil, site, and climatic features that affect crop productivity. "High inherent productivity" indicates that the soil, site, and climate have features that are very favorable for crop production. High yields and low risk of crop failure can be expected if a high level of management is employed. "Moderately high inherent productivity" indicates that the soil has features that are generally quite favorable crop production. Good yields and moderately low risk of crop failure can be expected. "Moderate inherent productivity" indicates that the soil has features that are generally favorable crop production. Good yields and moderate risk of crop failure can be expected. "Moderately low inherent productivity" indicates that the soil has features that are generally not favorable crop production. Low yields and moderately high risk of crop failure can be expected. "Low inherent productivity" indicates that the soil has one or more features that are unfavorable for crop production. Low yields and high risk of crop failure can be expected.

Numerical ratings indicate the overall productivity of the soil. The ratings are shown in decimal fractions ranging from 1.00 to 0.01. They indicate gradations between the point at which the combination of soil, site, and climate features has the greatest positive impact on inherent productivity (1.00) and the point at which the soil features are very unfavorable (0.01).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Report—NCCPI Overall (Indian Creek)

“National Commodity Crop Productivity Index” is a method of arraying the soils of the United States for non-irrigated commodity crop production based on their inherent soil properties. The interpretation is applicable to both heavily populated and sparsely populated areas. Ratings are for soils in their present condition. The present land use is not considered in the ratings.

NCCPI Overall–Franklin County, Missouri			
Map symbol and soil name	Pct. of map unit	NCCPI	
		Rating class and limiting features	Value
60056—Bardley gravelly silt loam, 20 to 50 percent slopes			
Bardley	90	Low inherent productivity	
		Cotton	0.03
		Small grains	0.08
		Corn and soybeans	0.08
66014—Haymond silt loam, 0 to 3 percent slopes, frequently flooded			
Haymond	90	Moderately high inherent productivity	
		Cotton	0.01
		Small grains	0.61
		Corn and soybeans	0.72
66031—Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded			
Haymond	40	High inherent productivity	
		Cotton	0.01
		Small grains	0.59
		Corn and soybeans	0.88
Relfe	35	Moderately low inherent productivity	
		Small grains	0.06
		Cotton	0.10
		Corn and soybeans	0.28
70009—Goss gravelly silt loam, 8 to 15 percent slopes			
Goss	85	Moderate inherent productivity	
		Small grains	0.38
		Cotton	0.48
		Corn and soybeans	0.50
73135—Union silt loam, 3 to 8 percent slopes			
Union	90	Moderate inherent productivity	
		Corn and soybeans	0.42
		Small grains	0.45
		Cotton	0.47
75376—Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded			
Cedargap	98	Moderate inherent productivity	
		Small grains	0.44
		Cotton	0.60
		Corn and soybeans	0.60

NCCPI Overall–Franklin County, Missouri			
Map symbol and soil name	Pct. of map unit	NCCPI	
		Rating class and limiting features	Value
75400—Gladden silt loam, 0 to 2 percent slopes, frequently flooded			
Gladden	85	Moderately high inherent productivity	
		Small grains	0.51
		Cotton	0.70
		Corn and soybeans	0.74
75489—Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded			
Gladden	65	Moderately high inherent productivity	
		Small grains	0.42
		Cotton	0.44
		Corn and soybeans	0.60
Midco	20	Moderately low inherent productivity	
		Small grains	0.11
		Cotton	0.12
		Corn and soybeans	0.31

Soil Chemical Properties

This folder contains a collection of tabular reports that present soil chemical properties. The reports (tables) include all selected map units and components for each map unit. Soil chemical properties are measured or inferred from direct observations in the field or laboratory. Examples of soil chemical properties include pH, cation exchange capacity, calcium carbonate, gypsum, and electrical conductivity.

Chemical Soil Properties (Indian Creek)

This table shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable cations plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. It is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced saturated hydraulic conductivity and aeration, and a general degradation of soil structure.

Chemical Soil Properties–Franklin County, Missouri								
Map symbol and soil name	**Depth**	**Cation-exchange capacity**	**Effective cation-exchange capacity**	**Soil reaction**	**Calcium carbonate**	**Gypsum**	**Salinity**	**Sodium adsorption ratio**
	In	*meq/100g*	*meq/100g*	*pH*	*Pct*	*Pct*	*mmhos/cm*	
60056—Bardley gravelly silt loam, 20 to 50 percent slopes								
Bardley	0-2	21-50	20-48	5.1-7.3	0	0	0.0-2.0	0
	2-10	10-18	8.0-16	5.1-7.3	0	0	0.0-2.0	0
	10-28	24-49	27-41	5.1-7.8	0	0	0.0-2.0	0
	28-80	—	—	—	0	0	0.0-2.0	0
66014—Haymond silt loam, 0 to 3 percent slopes, frequently flooded								
Haymond	0-7	8.0-18	—	6.1-7.3	0	0	0.0-2.0	0
	7-22	8.0-18	—	6.1-7.3	0	0	0.0-2.0	0
	22-80	4.0-20	—	6.1-7.3	0	0	0.0-2.0	0
66031—Haymond-Relfe complex, 0 to 3 percent slopes, frequently flooded								
Haymond	0-7	8.0-18	—	6.1-7.3	0	0	0.0-2.0	0
	7-22	8.0-18	—	6.1-7.3	0	0	0.0-2.0	0
	22-80	4.0-20	—	6.1-7.3	0	0	0.0-2.0	0
Relfe	0-6	6.0-12	4.0-10	5.6-7.8	0	0	0.0-2.0	0
	6-60	4.0-10	2.0-6.0	5.1-7.8	0	0	0.0-2.0	0
70009—Goss gravelly silt loam, 8 to 15 percent slopes								
Goss	0-6	9.0-22	7.0-23	4.5-6.5	0	0	0.0-2.0	0
	6-19	6.0-12	3.7-9.0	4.5-6.5	0	0	0.0-2.0	0
	19-60	17-26	13-20	4.5-7.3	0	0	0.0-2.0	0
	60-80	25-58	20-45	4.5-7.3	0	0	0.0-2.0	0

Chemical Soil Properties–Franklin County, Missouri								
Map symbol and soil name	**Depth**	**Cation-exchange capacity**	**Effective cation-exchange capacity**	**Soil reaction**	**Calcium carbonate**	**Gypsum**	**Salinity**	**Sodium adsorption ratio**
	In	*meq/100g*	*meq/100g*	*pH*	*Pct*	*Pct*	*mmhos/cm*	
73135—Union silt loam, 3 to 8 percent slopes								
Union	0-9	6.0-16	4.0-14	4.5-6.5	0	0	0.0-2.0	0
	9-30	14-24	10-20	3.5-5.5	0	0	0.0-2.0	0
	30-53	8.0-18	5.0-15	3.5-5.5	0	0	0.0-2.0	0
	53-80	16-34	15-35	4.5-6.5	0	0	0.0-2.0	0
75376—Cedargap gravelly silt loam, 0 to 2 percent slopes, frequently flooded								
Cedargap	0-9	8.0-24	5.0-14	5.1-7.3	0	0	0.0-2.0	0
	9-18	8.0-26	7.0-15	5.1-7.3	0	0	0.0-2.0	0
	18-49	10-20	7.0-15	5.1-7.3	0	0	0.0-2.0	0
	49-80	11-30	9.5-26	5.6-7.3	0	0	0.0-2.0	0
75400—Gladden silt loam, 0 to 2 percent slopes, frequently flooded								
Gladden	0-6	10-25	8.0-23	4.5-7.3	0	0	0.0-2.0	0
	6-38	7.0-16	7.0-19	4.5-7.3	0	0	0.0-2.0	0
	38-80	3.0-12	3.0-12	4.5-7.3	0	0	0.0-2.0	0
75489—Gladden-Midco complex, 0 to 3 percent slopes, frequently flooded								
Gladden	0-5	10-20	5.0-10	5.1-7.3	0	0	0.0-2.0	0
	5-53	2.0-10	3.0-7.0	5.1-7.3	0	0	0.0-2.0	0
	53-80	2.0-10	3.0-7.0	5.1-6.5	0	0	0.0-2.0	0
Midco	0-5	3.0-16	—	5.1-6.5	0	0	0.0-2.0	0
	5-40	2.0-10	—	5.6-6.5	0	0	0.0-2.0	0
	40-80	1.0-10	—	5.6-6.5	0	0	0.0-2.0	0

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